REMARKS

This amendment is responsive to the Office Action dated March 4, 2010. Applicant has amended claims 1, 12, 24, 34–38, and 40, and has added new claim 41. Claims 1–29, 31–38, and 40–41 are pending.

Telephonic Examiner Interview Summary

Applicant thanks the Examiner for conducting the telephonic Examiner Interview of June 1, 2010. Examiner Michael C. Lai, Primary Examiner Yves Dalencourt, and Applicant's representative Jennifer M.K. Rogers (Reg. No. 58,695) were involved in the telephonic Examiner Interview. The rejections of Claims 1 and 12 under 35 U.S.C. 103(a) and the prior art were discussed. Specifically, Applicant pointed out certain differences between the cited prior art and the requirements of claims 1 and 12. In addition, the rejections of claims 1, 24, 34, 38, and 40 under 35 U.S.C. 112, second paragraph were discussed. No agreement was reached. No exhibits or demonstrations were shown.

Claim Rejection Under 35 U.S.C. § 101

The Office Action rejected claims 34–37 under 35 U.S.C. 101 based on an assertion that the claimed invention is directed to non-statutory subject matter. Applicant has amended claims 34–37 to recite a non-transitory computer-readable medium, as proposed by the Office Action. Applicant submits that amended claims 34–37 are directed to non-statutory subject matter, and the rejection under 35 U.S.C. 101 should be withdrawn.

Claim Rejection Under 35 U.S.C. § 112, first paragraph

The Office Action rejected claims 1–29, 31–27 and 40 under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the enablement requirement.

Specifically, with regard to claims 1, 24, and 40 the Office Action asserted that the limitation of "wherein the first device continuously outputs the routing communications as the MAC address state information is learned by the first device" was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. To expedite prosecution, Applicant has amended claims 1, 24, and 40 to recite a first device outputting routing

communications including L2 service information comprising MAC address state information as the MAC address state information is learned by the first device. Support for this feature is found throughout the specification, such as at paragraphs [0034] and [0050]. For example, paragraph [0034] describes that a route reflector receives VPLS service information from another route reflector, and forwards the VPLS service information, e.g., L2 site information, to PE routers. One of ordinary skill in the art would recognize based on this that the VPLS service information (e.g., L2 state data such as MAC address state information) is forwarded to the PE routers as the VPLS service information is learned/received.

With regard to claims 12 and 34, the Office Action asserted that the limitation of "wherein the first routing protocol processes the L2 service information by injecting the L2 service information into stored route information and resolving the route information to associate routes associated with the injected L2 service information with respective next-hops" was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant has amended claims 12 and 34 for clarification to recite that L2 service information is processed in accordance with the first routing protocol.

Applicant submits that the features of claims 1–29, 31–27 and 40 are described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, as required by 35 U.S.C. 112, first paragraph. Accordingly, Applicant requests withdrawal of the rejection under 35 U.S.C. 112, first paragraph.

Claim Rejection Under 35 U.S.C. § 112, second paragraph

The Office Action rejected claims 1, 24, 34, 38 and 40 under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Office Action stated that "independent claims 1, 24, 34, and 38 are replete with intended use recitations, 'wherein' clauses." The Office Action asserted that "wherein" clauses are language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure, and thereby does not limit the scope of a claim or claim limitation. The Office Action cited MPEP 2106 as support for this assertion. While Applicant disagrees with the

Office Action's conclusions that independent claims 1, 24, 34, and 38 as previously presented include intended use recitations that do not limit the scope of the claims, Applicant has nonetheless reworded portions of claims 1, 24, 34, and 38 to make the claims more concise while retaining the same claimed features. Applicant is hopeful that these amendments have addressed the Examiner's concerns.

Applicant has also amended claim 40 to amend the typographical error identified by the Office Action.

Applicant submits that claims 1, 24, 34, 38 and 40 particularly point out and distinctly claim the subject matter, as required by 35 U.S.C. 112, second paragraph. Accordingly, Applicant requests withdrawal of the rejection under 35 U.S.C. 112, second paragraph.

Claim Rejection Under 35 U.S.C. § 103

The Office Action rejected claims 1–3, 5–14, 16–26, 28–29, 31–38 and 40 under 35 U.S.C. 103(a) as being unpatentable over Sanderson et al. (US 2004/0223500) in view of Kompella et al. (Non-Patent Literature- Virtual Private LAN Services of MPLS, "draft-ietf-ppvpn-vpls-idp-00.txt", herein Kompella). The Office Action also rejected claims 4, 15 and 4027 under 35 U.S.C. 103(a) as being unpatentable over Sanderson in view of Kompella as applied to claim 1 above, and further in view of Bragg (US 7,286,479). Applicant respectfully traverses the rejections to the extent such rejections may be considered applicable to the claims as amended. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and there would have been no apparent reason for modification to arrive at the claimed features.

Claim 1

Claim 1, as amended, recites establishing a peering session between a first device associated with a first customer network and a second device associated with a second customer network using a first routing protocol, and establishing a label switched path (LSP) through a plurality of intermediate networks communicatively coupled between the first customer network and the second customer network. Claim 1 further recites after establishing the peering session and the LSP, outputting by the first device routing communications over the peering session in accordance with the first routing protocol, the routing communications including layer two (L2)

service information comprising Media Access Control (MAC) address state information for devices in the first customer network, as the MAC address state information is learned by the first device. Claim 1 also recites providing an L2 service in accordance with the L2 service information to transport L2 communications between the first customer network and the second customer network through the plurality of intermediate networks using the LSP. Sanderson in view of Kompella fails to disclose or suggest these features.

The Office Action asserted that Sanderson discloses all of the features of claim 1, including the feature of "communicating L2 service information over a peering session using a first routing protocol, wherein communicating comprises outputting a routing communication in accordance with the first routing protocol." With regard to this feature, the Office Action cited paragraphs [0135]–[0136] of Sanderson. However, contrary to the assertions by the Office Action, these paragraphs of Sanderson do not provide any teaching or suggestion of communicating L2 service information over a peering session using a routing protocol. Instead, paragraph [0135] of Sanderson describes an IP routing table, which may be a VRF table within the PE router that has an IBGP peering relationship with another PE router for aggregating and forwarding customer VPN traffic across the core. Paragraph [0136] of Sanderson describes that when IBGP is used, the customer IP address space for a given customer VPN site is unique to the other VPN sites, and that a VPN packet having both an IP address and a route distinguisher is forwarded across a network. However, an IP address is a layer three (L3) address, and thus this disclosure does not teach or suggest communicating L2 service information over a peering session using a routing protocol, as required by claim 1.

The Office Action went on to acknowledge that Sanderson fails to disclose that the routing communication includes L2 service information that comprises MAC address state information for devices in the first customer network, wherein the first device continuously outputs the routing communications as the MAC address state information is learned by the first device. The Office Action cited Kompella as allegedly teaching this feature, and concluded that it would have been obvious to one of ordinary skill in the art to "incorporate Kompella's teaching into Sanderson's method for the purpose of facilitating interconnections among heterogeneous layer 2 virtual private network applications" and "providing connectivity between

geographically dispersed customer sites across MAN/WAN network(s), as if they were connected using a LAN."[1]

However, the Office Action failed to identify any specific passages of Kompella as disclosing the feature of outputting by the first device routing communications over the peering session in accordance with the first routing protocol, the routing communications including L2 service information comprising MAC address state information for devices in the first customer network, stating without more that "Kompella indeed discloses the limitation of routing protocol includes the L2 service information, and wherein the L2 service information comprises Media Access Control (MAC) address state information for devices in the first customer network."[2] In contrast to the assertions by the Office Action, the only mention in Kompella of "routing protocols" is in section 5, last paragraph, which states that "The PE device is typically an edge router capable of running a signaling protocol and/or routing protocols to set up pseudowires."[3] Nothing in Kompella suggests using a routing protocol to output routing communications that include L2 service information that comprises MAC address state information for devices in a customer network.

In view of the deficiencies of Sanderson and Kompella described above, Sanderson in view of Kompella fails to disclose or suggest the features of claim 1, as amended.

Claim 12

Claim 12 recites a device that includes one or more interface cards configured to communicate packets via input links and output links; a routing process that receives, via packets received by the one or more interface cards, label information for a LSP through a plurality of intermediate networks communicatively coupled between a first customer network and a second customer network. Claim 12 further recites a first routing protocol that executes on a control unit of the device, establishes a peering session between the device and a second device associated with the second customer network, and receives a routing communication over the peering session that includes L2 service information associated with the second customer network, wherein the L2 service information comprises MAC address state information for devices in the second customer network, wherein the control unit processes the L2 service

[1] Office Action dated March 3, 2010, at pages 8–9.
[2] Office Action dated March 4, 2010, at page 8.
[3] Kompella reference, at page 5, section 5.

information in accordance with the first routing protocol by injecting the L2 service information into stored route information and resolving the route information to associate routes associated with the injected L2 service information with respective next-hops. Claim 12 also recites an L2 service that operates in accordance with the L2 service information and transports L2 communications between the first customer network and the second customer network through the plurality of intermediate networks in accordance with the label information by outputting the L2 communications via the output links of the one or more interface cards. Sanderson in view of Kompella fails to disclose or suggest these features.

As explained above, Sanderson lacks any teaching of a routing protocol that receives L2 service information associated with a customer network by receiving a routing communication over a peering session that includes the L2 service information, contrary to the statements by the Office Action. The Office Action acknowledged that Sanderson fails to disclose that receiving a routing communication that includes L2 information that comprises MAC address state information for devices in a customer network, wherein a routing protocol processes the L2 service information by injecting the L2 service information into stored route information and resolving the route information to associate routes associated with the injected L2 service information with respective next-hops, but asserted that Kompella discloses these features. As support for this assertion, the Office Action cited Kompella at section 5.2, second paragraph. The Office Action stated that Kompella's teaching of associating an outbound virtual circuit (VC) LSP with a MAC address learned on an inbound VC LSP is "equivalent" to injecting L2 service information into stored route information and resolving the route information to associated routes. On this basis, the Office Action concluded that it would have been obvious for one of ordinary skill in the art to "incorporate Kompella's teaching into Sanderson's method for the purpose of providing connectivity across geographically dispersed customer sites across MAN/WAN network(s), as if they were connected using a LAN."[4]

Kompella at section 5.2 states:

> Unlike BGP VPNs [BGP-VPN], reachability information does **not** need to be advertised and **distributed via a control plane**. **Reachability is obtained by standard learning bridge functions in the data plane**.
>
> As discussed previously, a pseudowire consists of a pair of uni-directional VC LSPs. When a new MAC address is learned on an inbound VC LSP, it needs to

[4] Office Action dated March 4, 2010, at pages 13–14.

> be associated with the outbound VC LSP that is part of the same pair. The state of this pseudowire is considered operationally up when both incoming and outgoing VC LSPs are established. Similarly, it is considered operationally down when one of these two VC LSPs is torn down. (Emphasis added).

This passage of Kompella makes clear that its discussion of learning MAC addresses on an inbound VC LSP and associating the MAC address with an outbound VC LSP relates to standard learning bridge functions in the data plane, which is not done by distributing reachability information via a control plane. Standard learning bridge functions in the data plane do not involve sending routing communications over a peering session that include MAC address information, nor do standard learning bridge functions involve injecting MAC address state information received via such routing communications into stored route information. "Standard learning bridge functions in the data plane" refers to the process of, upon receiving a communication on an inbound VC LSP, learning a MAC address reachable by that VC LSP and associating the learned MAC address with the corresponding outbound VC LSP. This is entirely different from the requirements of claim 1, which relates to a routing protocol that operates in the control plane to send route communications.

In view of the deficiencies of Sanderson and Kompella described above, Sanderson in view of Kompella fails to disclose or suggest the features of claim 12, as amended.

Claim 24

Claim 24 recites a system that includes a border router that establishes an LSP through a plurality of intermediate networks, wherein the LSP communicatively couples a first customer network and a second customer network, and a first route reflector associated with the first customer network that establishes a peering session between the first route reflector and a second route reflector associated with the second customer network using an exterior routing protocol, and communicates with the second route reflector associated with the second customer network via routing communications that conform to the exterior routing protocol, and that include L2 service information that comprises MAC address state information for devices in the first customer network, as the MAC address state information is learned by the first route reflector. Claim 24 further recites an edge router that provides an L2 service to the first customer network in accordance with the L2 service information to transport L2 communications between the first

customer network and the second customer network through the plurality of intermediate networks using the LSP.

Claim 34

Claim 34 recites a non-transitory computer-readable medium comprising instructions to cause a processor to execute a routing process that receives, via a routing communication that conforms to a first routing protocol, label information for an LSP through a plurality of intermediate networks communicatively coupled between a first customer network and a second customer network, and receive, over a peering session established with the first routing protocol between the first customer network and the second customer network, L2 service information comprising MAC address state information for devices in the second customer network, and process, in accordance with the first routing protocol, the L2 service information by injecting the L2 service information into stored route information and resolving the route information to associate routes associated with the injected L2 service information with respective next-hops. Claim 34 further recites instructions to cause the processor to execute a L2 service that processes the L2 service information associated with the second customer network to extract the MAC address state information, and transport L2 communications between the first customer network and the second customer network through the plurality of intermediate networks in accordance with the MAC address state information using the LSP to emulate L2 connectivity across the intermediate networks.

For reasons similar to those set forth above, Sanderson in view of Kompella fails to teach or suggest these elements. For example, Sanderson in view of Kompella fails to teach or suggest receiving, over a peering session established with the first routing protocol between the first customer network and the second customer network, L2 service information comprising MAC address state information for devices in the second customer network, and processing, in accordance with the first routing protocol, the L2 service information by injecting the L2 service information into stored route information and resolving the route information to associate routes associated with the injected L2 service information with respective next-hops.

Claim 38

Claim 38 recites a method that includes establishing a peering session between a first device associated with a first customer network and a second device associated with a second customer network using a first routing protocol, establishing a LSP through a plurality of intermediate networks communicatively coupled between the first customer network and the second customer network, and after establishing the peering session and the LSP, the first device outputting over the peering session a routing communication in accordance with the first routing protocol, the routing communication including L2 service information MAC address state information for devices in the first customer network. Claim 38 also recites processing the L2 service information with the second device using the first routing protocol by injecting the L2 service information into stored route information and resolving the route information to associate routes associated with the injected L2 service information with respective next-hops, and providing an L2 service in accordance with the L2 service information to transport L2 communications between the first customer network and the second customer network through the plurality of intermediate networks using the LSP.

For reasons similar to those set forth above, Sanderson in view of Kompella fails to teach or suggest these elements. For example, Sanderson in view of Kompella fails to teach or suggest outputting over the peering session a routing communication in accordance with the first routing protocol, the routing communication including L2 service information MAC address state information for devices in the first customer network. As another example, Sanderson in view of Kompella fails to teach or suggest processing the L2 service information with the second device using the first routing protocol by injecting the L2 service information into stored route information and resolving the route information to associate routes associated with the injected L2 service information with respective next-hops.

Claim 40

Claim 40 recites a system that includes a border router that establishes an LSP through a plurality of intermediate networks, wherein the LSP communicatively couples a first customer network and a second customer network, and a first route reflector associated with the first customer network that establishes an Exterior Border Gateway Protocol (EBGP) peering session between the first route reflector and a second route reflector associated with the second customer network using the EBGP, and communicates L2 service information over the EBGP peering session with the second route reflector associated with the second customer network as the L2 service information is learned by outputting EBGP routing communications that include the L2 service information, and wherein the L2 service information comprises MAC address state information for devices in the first customer network. Claim 40 also includes an edge router that provides a Virtual Private LAN Service to the first customer network in accordance with the L2 service information to emulate L2 connectivity by transporting Ethernet communications between the first customer network and the second customer network through the plurality of intermediate networks using the LSP.

For reasons similar to those set forth above, Sanderson in view of Kompella fails to teach or suggest these elements. For example, Sanderson in view of Kompella fails to teach or suggest a route reflector that establishes an Exterior Border Gateway Protocol (EBGP) peering session between the first route reflector and a second route reflector associated with the second customer network using the EBGP, and communicates L2 service information over the EBGP peering session with the second route reflector associated with the second customer network as the L2 service information is learned by outputting EBGP routing communications that include the L2 service information, wherein the L2 service information comprises MAC address state information for devices in the first customer network.

For at least these reasons, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claims 1–29, 31–38, and 40–41 under 35 U.S.C. 103(a). Withdrawal of these rejections is requested.

New Claim:

Applicant has added claim 41 to the pending application. The applied references fail to disclose or suggest the inventions defined by Applicant's new claim, and there would have been no apparent reason for modification to arrive at the claimed features. As one example, the references fail to disclose or suggest the system of claim 40 wherein at least one of the plurality of intermediate networks does not support the L2 service, as recited by claim 41. No new matter has been added by the new claim.

CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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